

The Sardinia roman road network

An essay by Andreas J.M. Kropp titled "The Roman Road Network of North Sardinia and other topographical puzzles" was published in the journal "Orbis Terrarum" (n. 19, 2021, pp. 115-142). The author examines the Itinerarium Antonini, the only ancient source that provides some information about the road routes of Sardinia: "It is my engagement with the latter that has yielded substantially new results and that is the main reason for my writing this article on the homeland of my forebears."

Personally, I doubt that the new results praised by Kropp have achieved the objective the author set for himself. To arrive at his topographical proposals, he prefaces some postscripts to the text of the Itinerarium. *"The more important source of problems seems to be common assumptions about what the It. Ant. is, which then lead to unrealistic expectations of what it ought to deliver. If one considers the It. Ant. a road register or handbook, as many do, then one will expect to find the routes of the It. Ant. to correspond to actual roads that can be found and identified in the archaeological record. This is, however, a misunderstanding of the character of the It. Ant. The It. Ant. presents itself to the reader in a seductively factual shape: it offers bare-bones data, only names and figures, a seemingly neutral and objective record without embellishment. The data comes without orientation by compass points and hardly a reference to the physical geography. It is therefore not surprising that it is regularly taken at face value. When modern attempts at reconstructing the itineraries turn out impracticable, as they often do, the It. Ant. is singled out for blame for its alleged imprecisions, confusions, and scribal errors. The data is then tweaked, 'corrected', or dismissed. But the problem is not usually one of wrong numbers. Unavoidable errors aside, the data that the It. Ant. provides is reliable when compared with other ancient works of this kind and, when tested on the ground, it has more often than not proved accurate. Also the manuscript tradition of this document is very strong, as it survives in some 20 codices going back to the 8th c. AD. Flaws and foibles notwithstanding, as a source it is invaluable and indispensable, a rare ray of light on many dark corners of the Roman world. To be sure, many questions surrounding the It. Ant. remain unanswered. While the timeframe is relatively clear (in its extant form it dates to the Tetrarchic period; original edition possibly in the early third century), we do not know for certain what its sources or models are, or even what kind of sources were used (maps, registers, itineraries etc.); how, where and by whom it was compiled; to what extent the data was edited; or what its precise purpose was. Who was supposed to use the It. Ant., and for*

what? The *It. Ant.* is often considered a traveller's handbook or an official document, compiled on behalf of Roman authorities and made to facilitate the operations of Roman administrations in the provinces, incl. in many cases supervising the transport of resources from inland to the ports for transport to Rome and other major centres of consumption. These positions remain popular, but have long been called into question, with weighty arguments (see below) militating against the *It. Ant.*'s potential use for official or any other practical purpose [...] This distinction also matters for Roman Sardinia, as the prominent case of *Tibulas* and *Portus Tibulas* shows. The fact that the *It. Ant.* lists these names as apparent *capita viarum* has predisposed much of modern research about these enigmatic sites and continues to do so to the present day. As outlined above, traditionally these sites have been located at *Santa Teresa di Gallura*, more recently at or near *Castelsardo*. The fact that these two candidates, *Santa Teresa* and *Castelsardo*, are more than 60 km apart illustrates the uncertainty of these identifications. As their proponents admit, neither option is entirely satisfactory, since neither chimes fully with other sources or the topographical realities on the ground. The impossibility to pinpoint *Tibulas* and *Portus Tibulas* on the map with any degree of certainty is esp. vexing, since they are the starting points for three of the four key itineraries listed in the *It. Ant.* (plus the short-distance *per compendium* route), thus suggesting they were crucial knots in the road network. This strange prioritisation of two obscure sites is generally interpreted as a sign of the *It. Ant.* drawing on older data, from before the foundation and rise to fame of the Roman colony *Turris Libisonis* (which only features once, as *ad Turrem*, at 83.5 on the western coastal route). This may be true, but it is more likely that the prominence of *Tibulas* and *Portus Tibulas* is a mere mirage. Their selection as the starting points of four routes does not necessarily reflect their real-life import, but could instead be the arbitrary choice by the makers of the *It. Ant.* of starting points that they deemed convenient. As I shall discuss below, the choice of *Tibulas* and *Portus Tibulas* makes sense through the lens of the internal logic of the *It. Ant.* [...] The priority given to *Tibulas* and *Portus Tibulas* in the *It. Ant.* hence raises important questions on a methodological level about how to use and make sense of the data from the *It. Ant.* The selection and implicit ranking of sites as route stations in the itineraries cannot be taken as an accurate reflection of the relative importance of the actual sites of those names, e.g. as *capita viarum*. There are many other factors at play here that have less to do with the historical realities of the towns of Roman Sardinia and much more with the editing processes of the *It. Ant.* It is therefore important to examine more closely the peculiar route design

principles of the It. Ant. In mapping out space, the 'representation follows a territorial principle, but without observing a consistent, systematic classification of the material'. The It. Ant. does not aim for complete coverage, nor does it necessarily strive to offer a representative selection of key routes. But the selection and presentation of data does follow discernible principles. Its method is idiosyncratic and not always rational, but follows an inner logic which, once understood, facilitates the reconstruction of the road network. Though the quality and extent of the route coverage in the It. Ant. varies from province to province, one can nonetheless distil key features that recur with enough regularity to be considered typical for this source. The It. Ant. often:

- does not try to find the shortest connection from A to B (often draws zigzag lines)*
- does not prioritise main roads; draws routes combining bits of main and secondary roads*
- draws long lines from one end of the province to the other ('spine' routes), taking in points from which to branch out further routes*
- connects the same start and end points repeatedly, through different routes*
- repeats certain sections over several routes*
- takes detours with the apparent aim of taking in as many stations and stretches of road as possible.*

These quirks show that the It. Ant. was of little practical value. The routes are not rationally assembled itineraries with an eye to the hierarchies of the road system or the convenience of the traveller. The It. Ant. was not an official road record or a road manual for travellers, nor was it based on personal itineraries of actual travellers, unlike e.g. the It. Burdigalense. It may be fair to say that 'itinerary' is a misnomer; the It. Ant. is perhaps best described as a route inventory. Incidentally these quirks also reveal much about the sources and methods of the compilers. The operations outlined above – selecting start and end points at the farflung corners of a province to draw long lines; selecting specific stations because they offer opportunities to branch out and draw more lines; mashing together sections of small and large roads into routes; taking detours to take in more points and road sections – none of these operations can be done working only from written documents. For these tasks, the makers of the It. Ant. had to have an extensive cartographic documentation, i.e. maps, at their disposal, and the necessary skills to handle this visual material. These maps needed to be on a small enough scale to show entire regions at a view, complete with the road network and annotated with distances, perhaps something akin to the Peutinger Map [...] But these views need not be mutually exclusive: Map use in the Roman world does indeed appear to have

been very limited, and map competence even among the educated elite was poorly developed to a degree that is almost incomprehensible today. Nonetheless, with the *It. Ant.* we have what is to my mind a very convincing and important exception, a rare example of extensive map use. But this is not the place to expand on the arguments; I shall argue the case more fully elsewhere. It is curious that for such an elaborate and large-scale work, the compilers seem to have made no use of official records beyond what was in front of them. Records on the actual infrastructure on the ground, outlining key sites, ports, roads, the terrain, resources etc. were either ignored or out of reach. They approached their task with a blank slate, as it were, looked at a map, traced lines and wrote down the stations and distances, perhaps supplementing the data with other similarly barebones records. The sources they did use appear to be solid, but the execution leaves much to be desired. The *It. Ant.* has a raw feel to it, like a large-scale project abandoned half-way and still in need of more data-gathering and thorough editing before publication [...] Regarding the status of the roads chosen by the makers of the *It. Ant.*: The roads were probably *viae publicae*, as seems to generally be the case in this source, but for the roads that have yielded no milestones, e.g. almost all the coastal roads, this cannot be confirmed. In order to evaluate the route design, one can start by thinking about the actual road system on the ground: How would a rational route planner go about recording Sardinia's Roman road network? The coastal circuit, as said before, is one evident choice, and the *It. Ant.* covers it with two routes heading towards the sensible focal point of Caralis. But where a rational mind with even basic knowledge of Roman Sardinia would have chosen as starting points either *Turris Libisonis* or *Olbia*, the most important ports in the north, the *It. Ant.* picks the obscure *Tibulas* and *Portus Tibulas*. For the interior of the island, a planner with rudimentary knowledge of the local infrastructure would have focused above all on the island's key artery mentioned above, the bifurcated Y-shaped trunk road ending at Caralis, *Turris Libisonis* and *Olbia*, respectively. This road is littered with Roman milestones, yet absent as such from the *It. Ant.*: Neither Caralis – *Turris* nor Caralis – *Olbia* is listed there. This oddity is explicable from the priorities set out above: lengthening routes, but minimising their number; no overlap; no repetition. The trunk road (Calis – *Turris* viz. Caralis – *Olbia*) is covered to a large extent by the western inland route *Tibulas* – Caralis. For the *It. Ant.*, once this line was drawn, it was evidently not deemed necessary filling in the remaining gap, the northern section of the Caralis – *Turris Libisonis* road, by starting a new route, and so this remained unlisted. When given the choice between those two options, Caralis – *Turris Libisonis* or *Tibulas* – Caralis, the latter route was the more attractive pick for

the It. Ant., as it covered more ground and had more waystations."

Based on this methodological assumption, Kropp outlines his own map of Roman Sardinia that deviates from previous topographical acquisitions at many points. For example, along the western sector of the island: *"For the reconstruction of the western coastal route, which also starts from Tibulas (fig. 1), one can once again start from a fixed point, the fifth station Ad Turrem at (or adjacent to) Porto Torres, and then work backwards. Ad Herculem is well placed at Stintino at a distance of 18 miles (27 km). Next, for the 22 miles (33 km) to Erucium [Editor's note: 'No doubt identical with Ptolemy's Erykion at 3.3.7'], one has to first go back to Porto Torres (18 miles) and move 4 more miles (6 km) east along the coastal road. This would place Erucium in the area of Platamona. Next, 24 miles (37 km) take us to Viniola. Along the coastal route, this distance leads to Monte Vignoli, south of Valledoria in Anglona. The identification of Viniola with Monte Vignoli, based on the obvious homonym, has already been proposed by P. MELIS. This places Viniola very close to Portus Tibulas, but this choice is explicable not only from the principles outlined above (avoiding route overlap and waypoint repetition), but also, it seems likely that the compilers had no way of knowing how far Viniola and Portus Tibulas were actually apart. They knew that there was a direct connection between the two sites, because they led the per compendium route (see below) through here to Olbia. But, as I discuss below, from the sources they were using they were unable to determine the distance, as is obvious from the garbled mileage provided for that route. Finally, from Viniola it is another 12 miles (18 km) to Tibulas. With the coastal route already covered in both directions by other itineraries, this route should lead up the Coghinas valley. Along this route, the remains of at least three Roman bridges over the Coghinas have been reported. 18 km take us to roughly the same area identified before through the western inland route, between Bortigadas and Perfugas, on the banks of the Coghinas. Roman remains have long been known at this crucial river bottleneck. The traces of a Roman settlement at Tisiennari near the Ponte della Scaffa led early researches in the 19th century to locate Erucium here. Future fieldwork will hopefully be able to say more about this important location. As explained above, one need not expect Tibulas to be a prominent settlement with extensive remains. It may have been a modest waystation picked ad hoc by the makers of the It. Ant. because it was deemed a convenient starting point [...] In contrast to previous reconstructions, Tibulas here is a site distinct and at some distance from Portus Tibulas, and located in the hinterland rather than on the coast. Previous reconstructions have located both sites on the coast, each with a convenient natural harbour, but such a setup seems redundant.*

On my map, Portus Tibulas is in fact Tibulas' downriver outlet to the sea. There are other examples in our sources of such duplicate toponyms for maritime cities in the manner of 'X' and 'port of X' set up in this way, with the city in the hinterland at some distance from its port. In this reconstruction the two 'western' itineraries start from Tibulas in opposite directions, one east and one west, and complement each other. To either side, Tibulas is flanked by probably minor waystations, Viniola and Gemellae. The inclusion in the It. Ant. of such otherwise unattested stops can be explained from the practical logic of the itinerary: These are not mere waystations but crossroads: Viniola is where the road from Tibulas joins the coastal road to the west; Gemellae is where the Tibulas road joins the Caralis – Olbia road to the east. The setup on my map would hence explain the inclusion of these minor stations in the It. Ant. and confirm my reconstruction. The choice for Tibulas as the starting point for these two routes is, to my mind, entirely guided by the compilers intention to include the transversal road that connects Portus Tibulas to Olbia without having to list a separate route. Otherwise, this road would have remained unlisted, and the makers of the It. Ant. would have chosen Portus Tibulas as starting point for the western coastal route and Olbia for the western inland route".

Precisely regarding Gemellae, a station for which Kropp makes the following proposal: "Rather than drawing the route NW from Oschiri, I propose directing it to the NE along the road to Olbia. This road is partly visible in the terrain and documented by milestones, but this particular stretch has so far been assumed to be omitted from the It. Ant. 25 miles (37 km) up this road takes us to the area of Telti, a place that has yielded rich evidence for Roman roads [...] Beside the roads and milestones, extensive remains of Roman-period habitation were uncovered here, incl. building foundations and mosaic floors, as well as numerous Roman tombs. This is where I place Gemellae. [...] The final 25 miles (37 km) to Tibulas must then be along the road westward along the north flank of Monte Limbara. Here, too, there are well-documented remains of the Roman road along this route. 37 km takes us past Tempio Pausanias to the area between Bortigiadas and Perfugas. I would place Tibulas in this area." Also regarding the itinerary "a portu Tibulas per compendium Ulbia 16 mp", Kropp has clear ideas: "In this case, the mileage appears to be off. Whichever way one reconstructs the road network, there is no scenario in which Portus Tibulas is only 16 miles (23 km) away from Olbia. This problem is usually resolved by assuming a scribal error, where XVI should really read LVI mp. Looking at the new map, I wonder whether the 16 miles may not be applicable after all. The compendium in question, the direct route from Portus Tibulas to Olbia, includes

sections of two itineraries already listed elsewhere in the It. Ant.: the western coastal route from Portus Tibulas until Tibulas; then the western inland route from Tibulas to Gemellae. What is left, then, is the short stretch from Gemellae to Olbia. This gap is perhaps what the 16 miles refers to. If so, one can guess why the makers of the It. Ant. did not add up the numbers and give the whole distance Portus Tibulas – Olbia. Perhaps the records could not provide this information: Portus Tibulas, in this reconstruction, is very close to, but not on the western coastal route, and none of the itineraries spells out the distance from Portus Tibulas to, say, Tibulas. The makers of the It. Ant. were probably able to see with their own eyes, i.e. looking at some kind of map, that there was a shortcut from Portus Tibulas to Olbia, but lacked the information to determine the actual distance. In my reconstruction, the presumed 16-mile gap is the stretch from Telti (the presumed Gemellae) to Olbia: This tract of road is very well documented by milestones. At Telti milestones were found marking miles 165 and 166 from Caralis. Olbia city centre is probably at mile 177. The distance from Telti (Gemellae) to Olbia would hence be 12 rather than the 16 miles of the It. Ant. (if, again, this strange itinerary indeed refers to this stretch of road). On the other hand, more milestones were found several miles further down the road towards Olbia, at Roti li Pioni, but again indicating miles 165 and 166, and these milestones are more in tune with the dozens of others at the following stations, counting from 168 to 175. According to this measurement, the 16 miles of the It. Ant. for Telti – Olbia would once again be feasible." Only to immediately add: "But the evidence of the milestones on this stretch of road should be handled with great caution since few if any were found in their original locations".

I am in almost total disagreement with Kropp. To begin with, the fact that the Itinerarium Antonini is a kind of road medley with pieces arbitrarily extracted here and there from actually existing roads to obtain ideal routes seems to me refuted by reading the Itinerarium itself. (It is not an account of itineraries actually taken by a traveller but rather a collection of road alternatives and places considered useful to users of the imperial road network).

Certainly the impression one gets is of a somewhat disorderly and artificial compilation of multiple itineraries, but the redundancy and duplication of road stations is a consequence of the situation that must have presented itself to the observer of the road tracings. The choice of an itinerary to insert in a list is eminently subjective, unless it was an order imposed by public authority, and it is logical that not being able to fit the entire universe into a paper compendium, drastic cuts were made to the real road sequences, sacrificing the completeness of some roads and instead finding oneself with reduplicated stations as an

obvious consequence of different entrance and exit routes from the same localities (this also happens today). In other words, whoever compiled the *Itinerarium Antonini* did not make arbitrary choices to create mental routes but rather tried to assemble a catalog of the main road axes at the time of drafting the document, with inevitable omissions and perhaps debatable decisions as happens in cases of similar documentary collections (think of modern study guides, i.e. Italian Bignami, or the famous Baedeker). And the errors of the *Itinerarium* in calculating distances or in toponymy exist and must be acknowledged.

One can favorably welcome, on the other hand, what René Rebuffat argued in the article "Un document sur l'économie sarde" (*L'Africa romana*, 8, 1991, pp. 719-734). The French scholar, making a comparison between the centers cited by the *Itinerarium Antonini* and the productive areas of Sardinia and settlement situations and roads of Africa (Tunisia and Algeria), hypothesizes a precise economic purpose for the roads reported by the source. The plan of distances between the various centers would represent the framework of a system oriented toward the organization and management of products, and not a support intended for the common traveler like the modern kilometer charts placed at the conclusion of modern road atlases. Goods and raw products could be conveyed either toward urban areas or in the direction of port landings: in this sense the *Itinerarium*, still according to Rebuffat, would reflect an *annona* service structure present in Sardinia and reorganized during the 3rd century AD. The aspect highlighted by the French scholar would also allow interpreting the double mention of Tibulas, presented both as a settlement and as a port. Rebuffat also emphasized the dichotomy existing between the road network attested by the numerous milestones (over 150) found mostly in the central areas of Sardinia (except for some near Olbia) and the topology of the *Itinerarium* routes that develop mainly along the external perimeter of the island.

Deciding whether to support Kropp's innovative thesis or still rely on previous studies on Roman roads in Sardinia might seem like a reenactment of Buridan's ass, but upon careful consideration I have reported above a note by Kropp that makes the ass fall. "Erucium, no doubt identical with Ptolemy's Erykion at 3.3.7." The toponym used by Ptolemy is 'Ερίκινον (Ερύκινον according to codex X - Vaticanus Graecus 191 - of the *Geographia*) and cannot coincide with the Erucium of the Antonine. The reason is soon said: Erikinon is introduced with the words Πόλεις δὲ εἰσι μεσόγειοι· Ερίκινον (Ερύκινον) etc. "The cities that are in the interior of Sardinia."

Πόλεις δὲ εἰσι μεσόγειοι·

Ἐρίκινον (Ερύκινον) 31° 38' 30'

Ἡραϊον 31° 30' 38° 40'

But Kropp had just written that Erucium could be located at Platamona, therefore a coastal locality... Insignificant, one might say, but instead no, since Ptolemy himself provides a determining clue for the location of Tibulas (the coordinates are translated; variants from codex X in parentheses):

Ἡ Σαρδῶ (Σαρδών) νῆσος περιέχεται ἀπὸ μὲν ἀνατολῶν ὑπὸ τοῦ Τυρρηνικοῦ πελάγους, ἀπὸ δὲ μεσημβρίας ὑπὸ τοῦ Ἀφρικανοῦ (πελάγους), ἀπὸ δὲ δύσεως ὑπὸ τοῦ Σαρδῶου πελάγους, ἀπὸ δὲ ἄρκτων ὑπὸ τοῦ μεταξὺ αὐτῆς καὶ τῆς Κύρ-νου (Σκύρνου).

Καὶ ἡ μὲν παράλιος αὐτῆς περιγραφὴν ἔχει τοιαύτην·

Δυτικὴ πλευρά etc.

Μεσημβρινῆς πλευρᾶς περιγραφὴ etc.

Ἀνατολικῆς πλευρᾶς περιγραφὴ etc.

Βορείας πλευρᾶς περιγραφὴ·

Ερρεβάντιον (Σερρεβάντιον) ἄκρον 31° 30' 39° 30' (20')

Πλούβιον πόλις 31° 30' (20') 39° 05'

Ἰουλίολα πόλις 31° 10' (20') 39°

Τίβουλα πόλις 30° 40' 38° 50'

Πύργος Λιβίσωνος πόλις 30° 15' 38° 50'

Ptolemy asserts without ambiguity that he is describing the outline of Sardinia along the four cardinal points with the localities that are found on the edge of the geographical circuit or in the immediate hinterland. On the northern side is situated Tibula: therefore a city facing the sea and not inland as Kropp would have it. However, the expression "northern side" has been taken too literally by those who identify Tibula with Santa Teresa di Gallura or Capo Testa. The presence on the same side of the polis of Turris Libisonis (Porto Torres) makes it clear that the side in question extends far to the NW. Indeed, based on precise spherical trigonometry formulas, I have already clarified that the geodetic position of Tibula is closer to Castelsardo, on which there is also probably the greatest consensus among scholars.

On Portus Tibulas, Paolo Melis enters the merit by advancing the praiseworthy proposal of locating it at Cala Ostina: *"A little east of Castelsardo, along the coast, opens a small but deep inlet, at the mouth of a modest watercourse. On the maps it is cited as Cala Ostina, although a popular variant of the toponym supported by 17th-century documents sounds Cala Agostina, or also 'Scala Agostina' (Iscala Aultina). One could dwell at length on the*

suggestions offered by such toponymy: 'Cala Ostina' would seem a name coined to measure for this fairly comfortable and safe landing at the mouth of a watercourse; also the variant 'Scala Ostina (or Scala Agostina)' would seem to echo the memory of the tortuous and steep route (Iscale), which the road anciently followed to climb from the deep valley in which the inlet is set. The beach of Cala Ostina is indeed characterized by a considerable presence of ceramic remains from the Roman period, especially amphora fragments; among these are recognized types both of republican age (Dressel 1) and imperial (Dressel 2-4, 7-11, Tripolitana I). To the left of the inlet must have risen the installations of the landing: the remains of some buildings in opus caementicium are still visible, just emerging from the ground. Here one notices, on the surface, numerous ceramic fragments, pertaining to table services (Sigillata Italica and Chiara) and especially kitchen (Patine cenerognole). Regarding the ancient road, now in disuse, a notable stretch still paved remains: it climbed steeply the slope to the left of the inlet, until joining with that which, at mid-slope, came from Castelsardo and then from Turris continuing perhaps toward the territories of Anglona following more or less the route of the current S.S. 134. Another road now with natural bottom and with short stretches carved in the living rock climbed the opposite slope, to the right of the inlet, and proceeding along the coast reached as far as the plain of Valledoria" (Antichità romane del territorio di Castelsardo (Sassari), in "Archivio Storico Sardo", vol 37, Deputazione di Storia Patria per la Sardegna, Cagliari, 1992, pp. 11-28: 15-16).

For the moment I am inclined to accept Melis's hypothesis on the equivalence Portus Tibulas-Cala Ostina, but the doubt remains that in reality the port of Tibula could have been located at San Pietro a Mare, near the mouth of the Coghinas, according at least to the complex of archaeological data emerged there. The major obstacle for this last identification, however, is constituted by the very considerable distance between Castelsardo and San Pietro a Mare (about 8 km on the coastal line).

The settlements in the NW sector of Sardinia signaled by the Itinerarium are plausibly identifiable thus: Tibulas at Castelsardo, Portus Tibulas at Cala Ostina, Erucium in the area of Platamona as suggested by Kropp, Ad Herculem at Stintino. The statio of Viniolas (perhaps the Ἰουλίολα πόλις of Ptolemy), in my opinion cannot correspond to Vignola, too distant from Castelsardo, while the archaeological area of Monte Vignoli (according to Paolo Melis and Mauro Maxia) seems more apt: we would have on one hand the homonymy Viniolae-Vignoli and on the other the respect of distances from Castelsardo (Tibulas 12 miles) and Platamona (Erucium 24 miles). Spherical trigonometry, moreover, provides a contribution in this sense,

with the corrected Ptolemaic longitude at 8°40'26"E which indeed suits the area of Monte Vignoli. However, the motivation for inserting the stop of Viniolae in the eminently coastal route a Tibulas Sulcis escapes. The fact that it is marked as Item could be the sign of a choice made by sectioning road axes that branched from the surroundings of Castelsardo and Cala Ostina (indeed two out of four itineraries mention Portus Tibulas), rather than pointing to the most direct route between the two terminals.

Contrary to Kropp and differently from scholars who place it at Perfugas (for which Kropp's observations are valid) I think, but with much hesitation, that the mansio of Gemellae was situated near Bortigiadas - it being no longer possible to endorse the hypothesis that in its surroundings was found the mansio of Erucium (on whose localization Kropp himself saw well). The distances of Bortigiadas from Tibulas (Castelsardo) and from Luguidunec (Rovine Castro on the hill of San Simeone at Oschiri) are perfectly adherent to those of the Itinerarium Antonini. Tempio Pausania is too far from Castelsardo, opposite to Perfugas (if we maintain Tibulas at Castelsardo we must renounce the figures reported in the Itinerarium for the distance from Perfugas which is about 20 km against the 37 from Gemellae recorded in the source). The uncertainty about Bortigiadas stems from the lack of significant archaeological evidence, despite the reassuring words of P. Melis: *"Beyond all this, Tisiennari, and Bortigiadas itself, constituted in Roman times (and still today) the western gate of Gallura: the strategic point from which the Roman legions departed to tame the revolts of the warlike Bàlari, during the Republic and even beyond, penetrating into the mountains, through the valley of Rio Puddinu, along that road which still today, after two thousand years, continues to be the only communication route of that territory"* (Il territorio nell'antichità, in G. Gelsomino (ed.), "Bortigiadas, la storia & le storie", Vol. I, Sassari, 1997, pp. 17-62: 31).

From the necropolis of Ischia Cunnada, near Nostra Signora di Castro (Oschiri), come the funerary inscriptions of a mis(s)icius ex co(h)or(te) Aq(uitanorum) III, Ti. Iulius Capito, referring to the first decades of the 1st century AD (AE 1980,532); of Fauxtila, freedwoman of a (Ti. ?) Claudius Capito, perhaps also an auxiliary of the third cohort of Aquitanians (ELSard. p.645s.); of a Silo Terenti f(ilius), from the century of Antei Faustillus, perhaps a knight, who died after 35 years of service in the first half of the 1st century AD (AE 1980,533); from the same location comes a tile of the cohors p(rima ?) [S(ardorum)]. The attestation of the cohorts Ligurum at Tula and Olbia must undoubtedly be connected with the activity carried out by the unit in lower Gallura and Monte Acuto, controlling the territory of the Balari, an indigenous population mentioned by Livy (XLI 6, 5-6 and 12, 5-6) in struggle against the

Romans since the 2nd century BC: in this sector the role of the castrum of Luguido and the other outposts placed on the heights to control the Coghinas river valley must have been fundamental.

In Sardinia in the 1st century AD, the cohortes present there had merged into two cohortes geminae, the I gemina Sardorum et Corsorum and the II gemina Ligurum et Corsorum, documented in a diploma of Domitian from 87-88 AD from Sorgono (CIL XVI, 34) and in a second diploma of Nerva from 96 AD from Dorgali (CIL XVI, 40). Nothing could be easier than that the appellative Geminae of the mansio mentioned by the Itinerarium referred to the cohortes stationed in Gallura, perhaps right between Tempio and Bortigiadas.

For the record, I also cite the opinion of M. Pittau: "*In Roman times near Nulvi there was most probably the station called Gemellas, cited by the 'Antonine Itinerary' (81.6), on the road route that went from Tibulae (Castelsardo) to Caralis, touching Iafa (Giave) and Molaria (Mulargia). This station would in fact have been properly a military camp - as the presumable complete denomination Gemellas cohortes suggests - situated in an area very suitable for controlling the turbulent Balari of Perfugas*" (Toponimi della Sardegna settentrionale, 2013, ad v.).

Spherical trigonometry does not help much in deciding on the most suitable inhabited centers to host the Ptolemaic poleis of Ericinum and Heraion in the Sardinian interior. Nevertheless, Pittau's reasoning about Tempio Pausania is quite plausible and well-founded: "*The derivation of the toponym Tempio (Gallurese pronunciation Tèmpiu) from Lat. templum 'temple', through a Corsican-Tuscan linguistic mediation, is quite evident and is also ensured by the numerous forms it takes in medieval transcriptions: Villa Templi (GG 274). Since, however, it must be excluded that a locality drew its name from an ancient templum taken in a generic sense, the obligation is imposed to find to which divinity it was originally dedicated. Now the templum in question was with very great probability dedicated to Hera, as the ancient geographer Ptolemy (III 3,7) suggests, who for northern Sardinia speaks precisely of a Hérhaion, that is, of a 'temple of Hera', who - as we all know - was identified with the Etruscan-Roman divinity Juno (OPSE 124) (see Arzachena). Notable is the fact that Alberto La Marmora (Voyage, II 403) glimpsed that the Hérhaion was situated to the west of Olbia and that Karl Müller, the modern editor of Ptolemy, glimpsed that it was located on the road that led from Tibula to Olbia. Now, considering that for us Tibula was at Castelsardo and not at Santa Teresa di Gallura, the Templum (Iunonis) was right halfway between Tibula and Olbia, on the via per compendium that united these two ancient Sardinian cities (cf. 'Antonine Itinerary', 82.8,9)" (Toponimi della Sardegna settentrionale, 2013, ad v.). If this is the case*

(Heraion=Tempio Pausania), the geodetic distance between Heraion and Ericinum, assuming the length of the Greek stadium at 157 m, is equal to about 34 km, and moving this distance towards SW from Tempio one arrives precisely at Nulvi which could have been the seat of Ericinum. Obviously, then, the journey of 16 miles between Portus Tibulas (Cala Ostina) and Olbia is a mere scribal error and does not require further and useless comments or explanation attempts as Kropp has done.

As for the toponym Tibula, Raimondo Zucca had initially traced it back "to a pan-Mediterranean base *tab/*teb- 'rock, cliff, rocky height'" (Cornelia Tibullesia e la localizzazione di Tibula, in "Studi Sardi", XXVIII, 1988-89, pp. 333-347). More recently the scholar has adhered to the thesis of Di Salvo and Pittau on the derivation of the toponym from botany. In this regard Kropp observes: *"Recent etymological studies have shown that the toponym Tibulas refers to selvatic pine trees. Tibulus may have been a Latin synonym for pinus pinaster. The toponym would then refer to a site with vast forests of coastal pine trees, a resource that was esp. valued in shipbuilding and may have been a key factor in early Roman interest and settlement in the region. The site on the banks of the Coghinas identified here would suit this etymology perfectly, surrounded as it is by dense pine forests on the slopes of Monte Ruiu and Monte Limbara"* (The roman road network cit., pp. 137-138).

Even this evaluation by Kropp can be overturned if we read the passage by Zucca I just mentioned: "The Romanization of Anglona must be framed within the context of Roman policy for exploiting the resources of northern Sardinia already in the late republican age, once the warlike indigenous populations of the Balari (in the neighboring territory of Monte Acuto) and the Corsi had been pacified. The fulcrum of this phenomenon of acculturation of the local populi was constituted by an urban formation located on the Anglonese coast, presumably in the area of the mouth of the Coghinas river: Tibulas. The sources on the city of Tiboula do not go back beyond the Trajanic age (98-117 AD) to which is assigned, also as regards Sardinia, the complex of sources used during the 2nd century by the geographer Ptolemy. The Alexandrian geographer represents for us the oldest testimony of Tiboula. The same Ptolemy notes the localization of Tiboulatioi and Korsoi in the northernmost sector of Sardinia, apparently maintaining the Tiboulatioi to the west of the Korsoi. The Itinerarium Antonini records two viae departing from Tibulas and two viae departing from a Portus Tibulas:

- I) The via a Tibulas Sulcis, with Viniolas (Viniolae) as the first station of the via at 12 miles*
- II) The via a Tibulas Caralis, with Gemellas (Gemellae) as the first station at 25 miles*

III) *The via a Portu Tibulas Caralis, with Turublo minore at 14 miles from the Portus*

IV) *The via a Portu Tibulas per compendium Ulbia.*

Finally, to this meager list, we must add a medieval source: it is the *Ebstorf* world map which documents in the island of Sardinia the polonyms of *Caralis*, *Nura civ(itas)*, *Vlbio* and *Tybulo*. From the sources examined, the localization on the northern coast of Sardinia of a center called *Tibulas*, corresponding to the Ptolemaic *Tiboula*, and of a *Portus Tibulas* is clearly defined. The form of the poleonym of the city and port presents a problem not yet clarified: Ptolemy knows a feminine singular toponym: *Tiboula*, with the ethnic *Tiboulatioi*, the *Itinerarium Antonini* records an apparently plural form of the city's toponym - *Tibulas* - preceded by the preposition *a* which governs the ablative, so that one would consider *Tibulas* as indeclinable. Such interpretation would seem recommended by the port toponym *Portus Tibulas*, in which, unless one wants to consider a possible archaic genitive in *-as*, one could understand an undeclined form *Tibulas*. To decide us in this direction is, however, the Ptolemaic ethnic: the form *Tiboulatioi* with the suffix *-atioi* does not return in any other ethnic of the populi of Sardinia, while we find it especially in various areas of Italy for various ethnics, including *Antiates*; *Ardeates*; *Arpinates*; *Aquimates*; *Capenates*; *Fidenates*; *Ilvates* (*Ugures*); *Lavinates*; *Suffenates*. From this emerges the hypothesis of a poleonym - *Tibulas* - of Latin stamp, with the corresponding ethnic *Tibulates*, known in the Greek form *Tiboulatioi*, to which was added the ethnic *Tibul(l)enses*, from which derived the cognomen of ethnic type *Tibullesia*, borne by that *Cornelia Tibullesia*, known from the funerary cippus in granite discovered at *Capo Testa*. If we attribute to the Romans the foundation of a *Tibulas* in Sardinia we no longer have the need to invoke with *Emidio De Felice* a pan-Mediterranean base **tab-/teb-*, with the meaning of "rock, cliff, rocky height", while the hypothesis of *Lucia di Salvo* and *Massimo Pittau* appears more persuasive, who trace *Tibulas* back to Latin *tibulus* with the meaning of "wild pine", presumably of the species *Pinus pinaster* L. The toponymic formation *Tibulus* (which would be attested in the *Ebstorf* world map) - *Tibulas* would thus reflect a resource, that of coastal pine forests, which would have determined or facilitated the constitution of the settlement in Roman times. The nature of this center remains uncertain but the historical-cultural context we propose to recognize in it, that of republican Rome following the conquest of Sardinia and Corsica in 238/37 BC and the organization of the unitary province of Sardinia et Corsica in 227 BC, suggests the hypothesis of an organized exploitation of the pine resource for naval construction. The pine certainly represented a habitual element of the ancient Mediterranean landscape if it is true that it

*named numerous islands characterized precisely by an imposing forest cover of pines. Underwater archaeology has extensively documented the priority use of pine timber for ancient naval constructions, precisely in relation to the great abundance of this botanical type on the Mediterranean coasts, to such an extent that classical sources already noted the change in the Mediterranean landscape, notably of the islands, due to the intense deforestation carried out for naval construction. But the main document on the constitution of new centers for the production of Roman ships is constituted by the well-known passage from Theophrastus's *Historia plantarum* relating to the project of founding a naval center in Corsica in a chronological context indicated by historians around the middle of the 4th century BC. Theophrastus, after declaring that the most spectacular black pine and fir trees were those of Corsica, narrates the story of the first attempt to establish a Roman naval shipyard overseas:*

Once the Romans, wanting to build a fleet, sailed towards the island [of Kyrnos] with 25 ships; the dimensions of the trees however were such that during the reconnaissance of the gulfs and ports the breaking of the ships' masts forced them to land on a densely wooded coast. Moreover the island was entirely covered by the forest mantle and made as if wild by the woods. As a consequence of this the Romans gave up founding the city. Some of them, however, opened a passage and cut in a restricted area an enormous quantity of timber, which allowed them to build a raft of such dimensions that they equipped it with fifty sails; nevertheless the raft came apart on the high seas. Kyrnos thus, both because it remains in its natural state, and because of the soil and climate, far surpasses (for the woods) the other regions.

*It is evident that the Romans' purpose was to establish in Corsica (where the best raw material for naval construction abounded, black pine and fir, of superior quality to those of Latium) a city centered on naval shipyards. The planned city was to be a true overseas colony of at least five hundred men: in fact the 25 ships, probably pentekontoroi, could transport from 30 to 50 people each (in total from 750 to 1250 individuals, from which the rowers and other crew members must be subtracted). The colony was not successful because probably due to a storm near the coast the ships' masts broke and the boats, now unusable, had to be stripped of their fifty sails and whatever was recoverable. We could, therefore, think that Tibulas was the first Roman foundation of a productive settlement in northern Sardinia, in an area characterized by a landing place near a vast pine forest. If the considerations developed previously have value, the area of the Ptolemaic Tiboula must be traced back to the northern coastal sector east of Turris Ubisonis and west of *Ιουλιολα*, perhaps Viniolae of the *Itinerarium Antonini*, prevalently identified with today's Vignola. The localization of this Tiboula would then fall in the coastal stretch of today's Castelsardo, according to the*

hypothesis proposed by the founder of modern historical geography, Philippus Clauverius, at the beginning of the 17th century" (La romanizzazione dell'Anglona, in "Martis: l'Anglona e la Sardegna nella storia", Sassari, 2008, pp. 13-22: 13-14).

Another reflection on the incongruence highlighted by Kropp: "From Tibulas to Ad Turrem (Porto Torres), the route of the It. Ant. measures altogether 76 miles (112 km). Yet, the actual distance from Castelsardo to Porto Torres is a mere 25 km. While the suggestion to place ad Herculem opposite the island of Hercules (Asinara) at Stintino at the extreme NW tip of Sardinia, is sensible and takes some miles off the route by going to Stintino and back, the distances still do not add up. Furthermore, there is no room on the short stretch between Castelsardo and Porto Torres to fit in the stops Viniola and Erucium" (The roman road network cit., p. 126). Acute observation by Kropp, who catches a conspicuous flaw in the Antonine Itinerary rather than being proof of the necessity to place the Tibula station elsewhere as the author would like; it reminds me of one of my favorite pastimes from Settimana Enigmistica, namely finding the intruder in a little scene:

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[1] Item a Tibulas Sulcis m. p. CCLX:

[2] Viniolas m. p. XII

[3] Erucio m. p. XXIII

[4] Ad Herculem m. p. XXII

[5] Ad Turrem m. p. XVIII

....

Here the compiler (or copyist?) of the Itinerarium made a false step by inverting the stages of Ad Herculem and Ad Turrem, in addition to having juxtaposed, as mentioned, two competing road axes in the Tibulas/Portus Tibulas area. But if we remove the 22 miles of the mansio Ad Herculem, which comes after Ad Turrem, add the 4 miles of the difference between the two stations and subtract the 12 miles of Viniolas from the 24 that separate Erucium from Tibulas, the result is quite valid compared to the mutual distances, with the total of 16 miles for the Castelsardo-Porto Torres segment slightly less than the actual mileage between the two localities. I am of the opinion that it is not necessary to continue to encounter further weaknesses that characterize Kropp's new perspectives on ancient Sardinian roads and that it is certainly better to refer to the consolidated linguistic and topographical investigations of past scholars, albeit with due adjustments.

In the map below are indicated the places of discovery of the main milestones in Sardinia



Figures taken from the article "The Roman Road Network of North Sardinia and other topographical puzzles" by Andreas J.M. Kropp

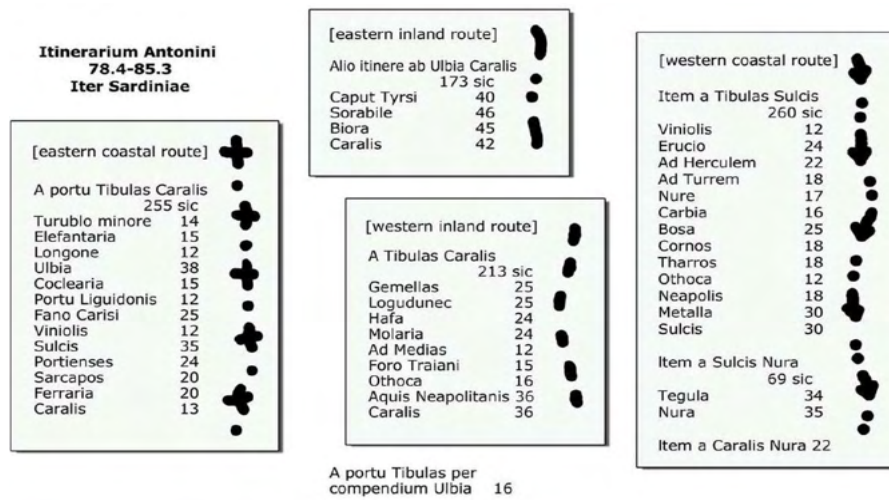


Fig. 1: The Sardinian section of the *Itinerarium Antonini* grouped into four routes (author).



Fig. 4: Author's reconstruction of the road network of Roman Sardinia.

Two images taken from code U - Vaticanus Urbinas Graecus 82 - of the Ptolemaic Geography. In the enlargement one can see that Tibula and Turris Libisonis are positioned at the left limit of the N - actually NW - segment of Sardinia, projected towards the island of Asinara (first on the left in the image) under which there is the Γορδίτανον (Γορτίτανον) ἄκρον.

